

Name: Answer Key

Date: _____

Alg II (H) Mid-Term Review

Ch 4 Solving Systems of 3 equations

$$\begin{array}{l} 1) \begin{array}{l} -x - 5y - 5z = 2 \\ 4x - 5y + 4z = 19 \\ x + 5y - z = -20 \end{array} \end{array} \quad \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} -2 \\ -3 \\ 3 \end{bmatrix}$$

$$\begin{array}{l} 2) \begin{array}{l} -4x - 5y - z = 18 \\ -2x - 5y - 2z = 12 \\ -2x + 5y + 2z = 4 \end{array} \end{array} \quad \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} -4 \\ 0 \\ -2 \end{bmatrix}$$

Ch 5 Operations with Polynomials

Factor.

$$3) x^4 - 2x^2 - 15 \quad (x^2 - 5)(x^2 + 3)$$

$$5) x^2 - 4x \quad x(x - 4)$$

$$7) 4x^2 - x - 4x + 1 \quad (4x - 1)(x - 1)$$

$$9) x^6 - 26x^3 - 27$$

$$(x + 1)(x - 3)(x^2 + 3x + 9)$$

$$4) x^2 - x - x + 1 \quad (x - 1)^2$$

$$6) 2x^2 + x - 6 \quad (2x - 3)(x + 2)$$

$$8) 4x^2 + 4x - 15 \quad (2x + 5)(2x - 3)$$

$$10) 16x^4 - 81$$

$$(2x + 3)(2x - 3)(4x^2 + 9)$$

Ch 6 Simplify the Rational Expression.

$$11) \frac{p' + 4}{p^2 + 6p + 8} = \frac{1}{p + 2}$$

$$12) \frac{a^2 + 5a + 4}{a^2 + 9a + 20} = \frac{a + 1}{a + 5}$$

$$13) \frac{x^2 - 2x - 15}{x^2 - 6x + 5} = \frac{x + 3}{x - 1}$$

$$14) \frac{v^2 - v - 56}{v^2 - 2v - 80} \div \frac{1}{v - 10} = \frac{(v - 8)(v + 7)}{v + 8}$$

$$15) \frac{n^2 + 2n - 3}{n^2 - 2n - 1} \div \frac{n + 3}{n + 2} = \frac{(n - 1)(n + 2)}{n^2 - 2n - 1}$$

$$16) \frac{x^2 + 7x - 8}{x + 8} \cdot \frac{x + 5}{9x - 9} = \frac{x + 5}{9}$$

$$17) \frac{10x^2 - 20x}{40x^3 + 80x^2} \cdot \frac{16x^3 + 80x^2}{6x + 30}$$

$$\frac{2x(x - 2)}{3(x + 2)}$$

$$18) \frac{\frac{16}{m - 3} - \frac{4}{m - 4}}{\frac{16}{m^2} - \frac{m - 4}{m - 3}}$$

$$\frac{m^2(12m - 52)}{(m - 4)(-m^3 + 4m^2 + 16m - 48)}$$

Solve.

$$19) \frac{a}{2a-6} - \frac{3}{a^2-6a+9} = \frac{a-2}{3a-9}$$

$$\boxed{a = -6 \text{ or } 5}$$

$$20) \frac{2x+3}{x-1} = \frac{10}{x^2-1} + \frac{2x-3}{x+1}$$

No solution $x \neq 1$

Use long division to divide the polynomials.

$$21) 5y-2 \overline{) 10y^3 + 6y^2 - 9y + 10}$$

$$(5y-2) \left(2y^2 + 2y - 1 + \frac{8}{5y-2} \right)$$

Use synthetic division to divide the polynomials.

$$22) (x^5 + 4x^3 - 3x^2 + 6x - 8) \div (x-2)$$

$$(x-2) \left(x^4 + 2x^3 + 8x^2 + 13x + 32 + \frac{56}{x-2} \right)$$

Ch 7.1 to 7.4 Operations with Radical Expressions.

Simplify.

$$23. \sqrt[3]{54x^4y^7} \Rightarrow 3xy^2\sqrt[3]{2xy}$$

$$24. \sqrt{(4x+4)^3} \Rightarrow 8|x+1|\sqrt{x+1}$$

$$25. -2\sqrt{24} - 3\sqrt{81} - 2\sqrt{6} \Rightarrow -6\sqrt{6} - 27$$

$$26. -3\sqrt{x-4} + x\sqrt{4x-16} \quad (2x-3)\sqrt{x-4}$$

$$27. \frac{\sqrt{28y^3}}{\sqrt{12y}} \quad \frac{|y|\sqrt{21}}{3}$$

$$28. \frac{\sqrt[3]{6}}{\sqrt[3]{54}} = \frac{1}{2}$$

$$29. (\sqrt{3} + \sqrt{7})^2 \quad 10 + 2\sqrt{21}$$

$$30. (\sqrt{8}-1)(\sqrt{8}+5) \quad 3 + 4\sqrt{8}$$

$$31. (\sqrt{5}-\sqrt{6})(\sqrt{5}+\sqrt{6}) \Rightarrow -1$$

$$32. \frac{4\sqrt{3}+5}{6\sqrt{2}-6\sqrt{3}} = \frac{4\sqrt{6}+12+5\sqrt{2}+5\sqrt{3}}{-6}$$

$$33. \frac{\sqrt{2}+\sqrt{5}}{\sqrt{2}-\sqrt{5}} \quad \frac{7+2\sqrt{10}}{-3}$$